



Docket No. 8733.048.20
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Yong Beom KIM et al.

Customer No. 30827

Application No. 10/756,371

Confirmation No. 2355

Filed: January 14, 2004

Art Unit: 2871

For: REFLECTIVE LIQUID CRYSTAL DISPLAY

Examiner: Dung T. Nguyen

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

In response to a Final Rejection of all pending claims that was mailed on May 18, 2005 and an Advisory Action that was mailed on September 23, 2005, and in support of a Notice of Appeal filed October 13, 2005, Appellants hereby submit this Appeal Brief.

The fees required under § 1.17(f) and any required petition for extension of time for filing this brief and fees therefore are dealt with in the accompanying transmittal.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37(c):

- I. Real Party in Interest**
- II. Related Appeals and Interferences**
- III. Status of Claims**
- IV. Status of Amendments**
- V. Summary of Claimed Subject Matter**
- VI. Grounds of Rejection to be Reviewed on Appeal**

VII. Argument

Appendix A Claims

Appendix B Evidence

Appendix C Related Proceedings

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is: LG.PHILIPS LCD CO., LTD.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Total Number of Claims in the Application

There are 12 claims pending in the application.

Current Status of Claims

Claims canceled: claims 11 and 12.

Claims withdrawn from consideration but not canceled: claims 13 and 14.

Claims pending: 1-10, 13 and 14.

Claims allowed: None.

Claims rejected: 1-10.

Claims on Appeal: The claims on appeal are claims 1-10.

IV. STATUS OF AMENDMENTS

The Examiner issued a Final Rejection on May 18, 2005 and an Advisory Action on September 23, 2005. No amendment has been filed in response to this Final Rejection or Advisory action. Accordingly, the claims enclosed herein as Appendix A reflect the current status of claims 1-10, 13 and 14.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention is directed to a reflective liquid crystal display device having increase brightness without sacrificing color purity. The reflective liquid crystal display includes a first and second substrates 30, 32 opposite to and spaced apart from each other. (See Fig. 1; page 9, lines 20-21; page 10, lines 2-4.) A liquid crystal layer 40 is interposed between the first and the second substrates 30, 32, the liquid crystal layer 40 having a first switching mode in which a phase of light is changed while passing through it, and a second switching mode in which the phase of light is not changed while passing through it. (See Figs. 5-9; page 10, lines 2-7.) The reflective liquid crystal display also includes first and second electrodes 42, 38 for applying an electric field to the liquid crystal layer 40. (See Fig. 5; page 9, lines 20-22; page 10, lines 2-7.) A semiconductor element is located on the second substrate 32 for switching an electric signal applied to the liquid crystal layer 40. (See page 5, lines 22-24.) Also, a retardation film 44 is located on the first substrate 30 for converting linearly polarized light into circularly polarized light. (See Fig. 5; page 9, lines 20-22; page 11, lines 14-15.) A linear polarizer 46 is located on the retardation film 44, for converting natural light into the linearly polarized light. (See Fig. 5; page 9, lines 20-22; page 11, lines 13-14.) Further, a cholesteric liquid crystal color filter 36 is located on the second substrate 32 for selectively reflecting light having at least one color received from the liquid crystal layer 40. (See Fig. 5; page 9, line 24 - page 10, line 1; page 10, lines 8-13.) A black background 34 located beneath the second substrate 32 for absorbing light passing through the cholesteric liquid crystal color filter 36. (See Fig. 5; page 9, lines 22-24.)

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The Examiner rejected claims 1-6 under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Admitted Related Art (ARA) in view of U.S. Patent No. 6,339,464 B1 to Anderson et al. (hereinafter "Anderson") and further in view of United States Patent 5,493,430 to Lu et al. (hereinafter "Lu"). The Examiner rejected claims 7-10 under 35 U.S.C. § 103(a) as being unpatentable over the ARA in view of U.S. Patent No. 4,589,734 to Needham et al. (hereinafter "Needham") and further in view of Anderson and Lu.

VII. ARGUMENT

- A. The Examiner improperly rejected claims 1-6 under 35 U.S.C. § 103(a) as being allegedly unpatentable over the ARA in view of Anderson and Lu.

Claims 1-6 are allowable over the cited references in that each of these claims recites a combination of elements including, for example, "a liquid crystal layer for receiving the circularly polarized light and varying the phase of the circularly polarized light depending on the presence of an applied electric field." None of the cited references including the ARA, Anderson, and Lu, singly or in combination, teaches or suggests at least this feature of the claimed invention.

In the Office Action, the Examiner claims that the liquid crystal layer 16 of the ARA receives "the circularly polarized light and varying the phase of the circularly polarized light depending on the presence of an applied electric field." This is actually not the case. As can be seen in Figures 2 and 3 of the present application, the liquid crystal 16 of the ARA actually converts circularly polarized light into linearly polarized light. In the present invention, the liquid crystal layer changes the phase or direction of rotation of the circularly polarized light. Therefore, the ARA is different from the claimed invention.

In the Advisory Action, the Examiner states: "Applicant argues the Admitted Related Art of Figures 2 and 3. However, Figures 2 and 3 were not relied upon for the Rejection of claim 1 - rather, it was Figure 1 that had been relied upon." Figures 2 and 3 illustrate the operation of the conventional reflective liquid crystal display shown in Figure 1. Further, on page 3, lines 7-13 of

the specification, the liquid crystal of the conventional reflective liquid crystal display of Figure 1 is described as converting circularly polarized light into linearly polarized light and converting linearly polarized light into circularly polarized light as discussed above with respect to Figures 2 and 3. Accordingly, Applicant respectfully submits that claims 1-10 are allowable over the cited references.

B. The Examiner improperly rejected claims 7-10 under 35 U.S.C. § 103(a) as being allegedly unpatentable over the ARA in view of Needham and further in view of Anderson and Lu.


Claims 7-10 are allowable over the cited references in that each of these claims recites a combination of elements including, for example, "a liquid crystal layer interposed between the first and the second substrates, the liquid crystal layer having a first switching mode in which a phase of light is changed while passing through it, and a second switching mode in which the phase of light is not changed while passing through it." The arguments stated above apply to claims 7-10 as well. Accordingly, claims 7-10 are allowable over the cited references.

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. § 1.136, and any additional fees required under 37 C.F.R. § 1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

Dated: April 12, 2006

By 
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APPENDIX A

Claims Involved In The Appeal Of Application No. 10/756,371:

1. (Original) A reflective liquid crystal display comprising:
a linear polarizer for converting natural light into linearly polarized light;
a retardation film for converting the linearly polarized light into circularly polarized light;
a liquid crystal layer for receiving the circularly polarized light and varying the phase of the circularly polarized light depending on the presence of an applied electric field;
a cholesteric liquid crystal color filter for receiving the circularly polarized light from the liquid crystal layer, and selectively reflecting the circularly polarized light received from the liquid crystal layer; and
a black background for absorbing a portion of light passing through the color filter.
2. (Original) The reflective liquid crystal display of claim 1, wherein the retardation film is a $\lambda/4$ plate.
3. (Original) The reflective liquid crystal display of claim 1, wherein the black background is located beneath the color filter.
4. (Original) The reflective liquid crystal display of claim 1, wherein the retardation film is located between the linear polarizer and the color filter.
5. (Original) The reflective liquid crystal display of claim 1, wherein the black background is made of a polymeric material.
6. (Original) The reflective liquid crystal display of claim 1, wherein a bandwidth of the color filter can be controlled by adjusting a pitch of the cholesteric liquid crystal color filter.
7. (Original) A reflective liquid crystal display comprising:
first and second substrates opposite to and spaced apart from each other;
a liquid crystal layer interposed between the first and the second substrates, the liquid

crystal layer having a first switching mode in which a phase of light is changed while passing through it, and a second switching mode in which the phase of light is not changed while passing through it;

first and second electrodes for applying an electric field to the liquid crystal layer;

a semiconductor element located on the second substrate for switching an electric signal applied to the liquid crystal layer;

a retardation film located on the first substrate for converting linearly polarized light into circularly polarized light;

a linear polarizer located on the retardation film, for converting natural light into the linearly polarized light;

a cholesteric liquid crystal color filter located on the second substrate for selectively reflecting light having at least one color received from the liquid crystal layer; and

a black background located beneath the second substrate for absorbing light passing through the cholesteric liquid crystal color filter.

8. (Original) The reflective liquid crystal display of claim 7, wherein the retardation film is a $\lambda/4$ plate.

9. (Original) The reflective liquid crystal display of claim 7, wherein the black background is made of a polymeric material.

10. (Original) The reflective liquid crystal display of claim 7, wherein a bandwidth of the color filter can be controlled by adjusting a pitch of the cholesteric liquid crystal color filter.

11. Canceled

12. Canceled

13. (Withdrawn) A reflective color liquid crystal display device, comprising:
a first substrate;
a second substrate spaced apart from and opposite to the first substrate, the second

substrate having arranged thereon a plurality of pixel electrodes and corresponding common electrodes being spaced apart from each other;

a linear polarizer changing natural light into linearly polarized light and being positioned at an outer surface of the first substrate;

a liquid crystal layer interposed between the first and second substrates and having liquid crystal molecules being oriented by a parallel electric field between each pixel electrode and corresponding common electrode;

a cholesteric liquid crystal color filter disposed between the liquid crystal layer and the second substrate, selectively reflecting light received from the liquid crystal layer; and

a black background absorbing light passing through the cholesteric liquid crystal color filter.

14. (Withdrawn) The reflective color liquid crystal display device of claim 13, further comprising a negative uniaxial film arranged on the liquid crystal layer.

APPENDIX B

Evidence:

None.

APPENDIX C

Related Proceedings:

None.

the specification, the liquid crystal of the conventional reflective liquid crystal display of Figure 1 is described as converting circularly polarized light into linearly polarized light and converting linearly polarized light into circularly polarized light as discussed above with respect to Figures 2 and 3. Accordingly, Applicant respectfully submits that claims 1-10 are allowable over the cited references.

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